

under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 19-0036.

Amendments

In the Claims:

Please substitute the following claim 1 for the pending claim 1:

Sub
C₁
B¹

1. (Amended) A particle for transfecting higher eucaryotic cells with nucleic acid molecules *in vitro* and *in vivo* comprising one or more nucleic acid molecules condensed by organic cationic molecules, said particle being obtained by (1) condensing said one or more nucleic acid molecules with identical or different organic cationic precursor molecules without crosslinking any of said one or more nucleic acid molecules, and (2) thereafter linking the precursor molecules to each other with one or more covalent bonds on the condensed one or more nucleic acid molecules.

Please substitute the following claim 3 for the pending claim 3:

3. (Amended) The transfection particle of claim 2, wherein the cationic detergent precursor molecules comprise:

- B²
- a) at least one functional group for binding to one or more other detergent molecules,
 - b) at least one lipophilic residue,
 - c) a non-toxic recipient backbone,
 - d) a cationic group for binding to nucleic acid molecules.

Please substitute the following claim 4 for the pending claim 4:

B³
4. (Amended) The transfection particle of claim 3, wherein the functional group of the cationic precursor detergent molecules for binding to other detergent molecules is a dimerizable or polymerizable functional group selected from the group consisting of thiols, acid hydrazides, aldehydes, amines, and ethylene residues that are suitably substituted to provide enamines upon reaction with an amine.

Please substitute the following claim 5 for the pending claim 5:

B⁴
5. (Amended) The transfection particle of claim 4, wherein the lipophilic residue is selected from the group consisting of lipophilic amides, esters and ethers.

Please substitute the following claim 6 for the pending claim 6:

B⁵
6. (Amended) The transfection particle of claim 3, wherein the functional group for binding to nucleic acid molecules is selected from an amine or derivative thereof.

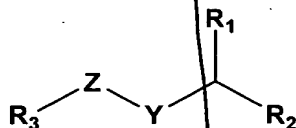
Please substitute the following claim 7 for the pending claim 7:

B⁶
7. (Amended) The transfection particle of claim 6, wherein the functional group for binding to nucleic acid molecules is guanidine.

Please substitute the following claim 8 for the pending claim 8:

sub C27
B⁷
8. (Amended) The transfection particle of claim 1, wherein the organic cationic precursor molecule is represented by general formula I

- 4 -



(I)

wherein

R_1 denotes $(C_1-C_{10}\text{-alkylene})\text{-SH}$, wherein the alkylene radical may represent a straight chained or branched hydrocarbon;

R_2 denotes $\text{-NR}_4\text{R}_5$, $\text{-NHR}_4\text{R}_5^+$, $\text{-N(R}_4)_2\text{R}_5^+$, $\text{-C(=NR}_4)\text{NR}_5\text{R}_6$, $\text{-C(=X)-C}_1\text{-C}_{10}\text{-alkylene}$, wherein the alkylene radical may represent a straight chained or branched hydrocarbon and may be substituted by up to four dialkyl amino groups or a thiomonosaccharide;

R_3 denotes $C_5\text{-C}_{30}\text{-alkyl}$, straight chained or branched and optionally substituted with one or more halogen atoms or dialkyl amino groups, or $C_5\text{-C}_{30}\text{-alkenyl}$, straight chained or branched having up to ten $\text{C}=\text{C}$ -double bonds and is optionally substituted with one or more halogen atoms or dialkyl amino groups, or

$C_5\text{-C}_{30}\text{-alkynyl}$, straight chained or branched having up to ten $\text{C}\equiv\text{C}$ -triple bonds and is optionally substituted with one or more halogen atoms or dialkyl amino groups, or

$C_6\text{-C}_{10}\text{-aryl}$ optionally substituted, or

$C_7\text{-C}_{16}\text{-aralkyl}$ optionally substituted, or a

$C_5\text{-C}_{30}\text{-alkyl-chain}$ interrupted by up to 10 amino groups $\text{-NR}_4\text{-}$ and having optionally an amino-group which is optionally substituted by an amino acid;

Sub
C2

B⁷
cont'd

Sub C2
B7 cont'd

R_4 , R_5 and R_6 denote independently from each other hydrogen or

C_1 - C_4 -alkyl;

X denotes O or S;

Y denotes C=O or C=S and

Z denotes O, S or $-NR_4$.

Please substitute the following claim 9 for the pending claim 9:

Sub C3
B8

9. (Amended) The transfection particle of claim 8, wherein the cationic precursor molecules correspond to general formula I, wherein

R_1 denotes $(C_1$ - C_6 -alkylene)-SH, wherein the alkylene radical may represent a straight chained or branched hydrocarbon;

R_2 denotes $-NR_4R_5$, $-NHR_4R_5^+$, $-N(R_4)_2R_5^+$, $-C(=NR_4)NR_5R_6$, $-C(=X)-C_1$ - C_4 -alkylene, wherein the alkylene radical may represent a straight chained or branched hydrocarbon and may be substituted by up to four amino radicals $-NR_4R_5$ or a thiomonosaccharide;

R_3 denotes C_5 - C_{20} -alkyl, straight chained or branched and optionally substituted with F, Cl, Br or $-NR_4R_5$, or

C_5 - C_{20} -alkenyl, straight chained or branched having up to five C=C-double bonds and is optionally substituted with F, Cl, Br or $-NR_4R_5$, or

C_5 - C_{20} -alkynyl, straight chained or branched having up to five C≡C-triple bonds and is optionally substituted with F, Cl, Br or $-NR_4R_5$, or

C_6 - C_{10} -aryl optionally substituted with C_1 - C_4 -alkyl, F, Cl, Br or $-NR_4R_5$, or

Sub C3
B⁸ cont'd

C₇-C₁₄-aralkyl optionally substituted with C₁-C₄-alkyl, F, Cl, Br or
-NR₄R₅, or

a C₅-C₂₀-alkyl chain interrupted by up to 10 amino groups -NR₄- and
having optionally an amino group which is optionally substituted by an
amino acid;

R₄, R₅ and R₆ denote independently from each other hydrogen or
C₁-C₄-alkyl;

X denotes O or S;

Y denotes C=O or C=S and

Z denotes O, S or -NR₄-.

Please substitute the following claim 10 for the pending claim 10:

Sub C4
B⁹

10. (Amended) The transfection particle of claim 8, wherein the cationic
precursor molecules correspond to general formula I, wherein

R₁ denotes (C₁-C₄-alkylene)-SH, wherein the alkylene radical may
represent a straight chained or branched hydrocarbon;

R₂ denotes -NR₄R₅, -NHR₄R₅⁺, -N(R₄)₂R₅⁺, -C(=NR₄)NR₅R₆,

-C(=X)-C₁-C₄-alkyl, wherein the alkyl radical may represent a straight
chained or branched hydrocarbon and may be substituted by up to four
amino radicals -NR₄R₅, or a thiomonosaccharide;

R₃ C₅-C₁₂-alkyl, straight chained or branched and optionally
substituted with F, Cl, Br or -NH₂, or a

Sub C4
B⁹ cont'd

C₅-C₁₅-alkyl chain interrupted by up to 7 amino groups -NR₄- and having optionally an amino group which is optionally substituted by the amino acid cysteine;

R₄, R₅ and R₆ denote independently from each other hydrogen or methyl, ethyl, propyl, iso-propyl, n-butyl, iso-butyl or tert-butyl;

X denotes O or S;

Y denotes C=O or C=S and

Z denotes O, S or -NR₄-.

Please substitute the following claim 11 for the pending claim 11:

Sub C5
B¹⁰

11. (Amended) The transfection particle of claim 8, wherein the cationic precursor molecules correspond to the general formula I, wherein

R₁ denotes -CH₂-SH;

R₂ denotes -NH₂, -NH₃⁺, -C(=N⁺H₂)NH₂, -C(=O)-C₁-C₄-alkyl straight chained or branched and optionally substituted with F, Cl, Br or -NH₂, or an ornithine radical or a S-galactosyl radical;

R₃ denotes a C₆-C₁₅-alkyl radical straight chained or branched and optionally substituted with F, Cl, Br or -NH₂;

Y denotes C=O;

Z denotes O or -NH-.

Please substitute the following claim 22 for the pending claim 22:

Sub C11
B11

22. (Amended) The transfection particle of claim 1, wherein the one or more covalent bonds between the cationic molecules are degradable under cellular conditions.

Please substitute the following claim 27 for the pending claim 27:

Sub C12
B12

27. (Amended) The transfection particle of claim 1, characterized in that it is linked via one or more covalent bonds to one or more cellular targeting functionalities and/or one or more functionalities capable of facilitating endocytosis.

Please substitute the following claim 28 for the pending claim 28:

Sub C13
B13

28. (Amended) The transfection particle of claim 27, wherein said functionalities are linked via said one or more covalent bonds to the cationic molecules.

Please substitute the following claim 29 for the pending claim 29:

Sub C14
B14

29. (Amended) The transfection particle of claim 27, wherein said functionalities are linked via said one or more covalent bonds to nucleic acid binding molecules that are present in addition to the cationic molecules.

Please substitute the following claim 30 for the pending claim 30:

Sub C15
B15

30. (Amended) The transfection particle of claim 27, wherein the targeting functionality is a cellular protein ligand.

Please substitute the following claim 31 for the pending claim 31:

Sub C14
B14
31. (Amended) The transfection particle of claim 27, wherein the targeting functionality is a sugar residue.

Please substitute the following claim 46 for the pending claim 46:

Sub C17
B17
46. (Amended) The kit of parts of claim 45 comprising in addition or more functionality for cellular targeting.

Please substitute the following claim 47 for the pending claim 47:

B18
47. (Amended) The kit of parts of claim 45 comprising in addition one or more endosomolytic functionalities.

Please add the following claim:

Sub C23
B19
48. (new) A particle for transfecting higher eucaryotic cells with nucleic acid molecules *in vitro* and *in vivo* comprising:
a) one or more nucleic acid molecules;
b) identical or different organic cationic precursor molecules linked to each other via one or more covalent bonds;
wherein said precursor molecules are ionically associated with said one or more nucleic acid molecules without forming any crosslinks between said nucleic acid molecules and said cationic precursor molecules, thereby condensing said one or more nucleic acid molecules.